

S/N. 09/362,924

Page 2 of 17

**IN THE CLAIMS**

Please cancel claims 16, 20-23, 25, 43 and 50 without prejudice or disclaimer.

Please substitute the following amended claims for the corresponding original claims. A marked copy of the claim amendments is attached hereto.

1. (amended three times) A method of treating a chamber to at least partially remove residue from surfaces in the chamber, the method comprising:
- (a) transferring a substrate into the chamber and electrostatically holding the substrate on an electrostatic chuck;
  - (b) providing an energized first process gas comprising one or more of  $\text{CF}_4$ ,  $\text{SF}_6$  and  $\text{NF}_3$  in the chamber to treat the surfaces in the chamber; and
  - (c) providing an energized second process gas in the chamber to further treat the surfaces in the chamber and to assist in de-chucking the substrate from the electrostatic chuck, the second process gas being different than the first process gas.

2. (twice amended) A method of etching a substrate comprising a metal silicide containing layer and a polysilicon containing layer in a chamber and cleaning etchant residue formed on surfaces in the chamber, the method comprising the steps of:

- (a) electrostatically holding the substrate comprising the metal silicide and polysilicon containing layers on an electrostatic chuck in the chamber;
- (b) in a first stage, providing an energized first process gas in the chamber to etch through the metal silicide containing layer, the first process gas comprising a substrate etching gas and a first cleaning gas comprising a fluorinated gas;
- (c) in a second stage conducted after (b), providing a second energized process gas in the chamber to etch through the polysilicon containing layer; and

S/N: 09/362,924

Page 3 of 17

(d) in a third stage conducted after (c), providing an energized second cleaning gas comprising an electronegative plasma in the chamber, the energized second cleaning gas being different from the first cleaning gas.

~~16~~ 20. (amended) A method according to claim ~~17~~ wherein the fluorinated gas comprises one or more of  $\text{CF}_4$ ,  $\text{SF}_6$  and  $\text{NF}_3$ .

19. (twice amended) A method of etching a substrate in a chamber and cleaning etchant residue from surfaces in the chamber, the method comprising the steps of:

- (a) placing the substrate in the chamber;
- (b) providing an energized first gas in the chamber, the energized first gas being capable of etching a first material on the substrate thereby depositing a first etchant residue on the surfaces in the chamber;

(c) after (b), providing an energized second gas comprising a fluorinated cleaning gas in the chamber, the energized second gas being capable of etching a second material on the substrate while suppressing deposition of a second etchant residue onto the first etchant residue, the first etchant residue being compositionally different from the second etchant residue; and

(d) after (c), providing a cleaning gas comprising an oxygen containing gas in the chamber and coupling RF power to energize the cleaning gas to clean the first and second etchant residue deposits formed on the surfaces in the chamber.

~~14~~ 24. (twice amended) A method according to claim ~~18~~ wherein the fluorinated cleaning gas comprises one or more of  $\text{CF}_4$ ,  $\text{SF}_6$  and  $\text{NF}_3$ .

~~13~~ 26. (amended) A method according to claim ~~19~~ wherein the oxygen containing gas consists essentially of oxygen.

S/N: 09/362,924

Page 4 of 17

23 35. (twice amended) A method of etching a substrate in a chamber and cleaning residue that forms on surfaces in the chamber, the method comprising the steps of:

(a) placing the substrate in the chamber and electrostatically holding the substrate on an electrostatic chuck;

(b) in an etching stage, etching one or more materials on the substrate using energized gas, at least one composition of the energized gas including an etching gas comprising one or more of  $\text{Cl}_2$ ,  $\text{N}_2$ ,  $\text{O}_2$ ,  $\text{HBr}$  and  $\text{He-O}_2$ ; and a residue cleaning gas comprising one or more of  $\text{CF}_4$ ,  $\text{SF}_6$  and  $\text{NF}_3$ ; and

(c) cleaning the residue formed on the surfaces in the chamber and assisting in dechucking the substrate from the electrostatic chuck using another energized gas comprising oxygen.

41. (twice amended) A method of cleaning a chamber to remove residue from surfaces of a ceiling portion in the chamber, the chamber having an antenna adjacent to the ceiling portion, and the method comprising the steps of:

(a) providing an energized first process gas in the chamber to clean the surfaces in the chamber; and

(b) setting a chamber source power level applied to the antenna to remove residue from the surfaces of the ceiling portion.

45. (amended) A method according to claim 44 wherein the oxygen containing gas consists essentially of oxygen.

23 47. (twice amended) A method of etching a substrate in a chamber and at least partially removing etchant residue from surfaces in the chamber, the method comprising:

(a) supporting the substrate in the chamber, the substrate having a metal silicide containing layer thereon;

S/N: 09/362,924

Page 5 of 17

(b) providing an energized gas in the chamber to etch through the metal silicide containing layer, the energized gas comprising a fluorinated gas;

(c) after (b), providing an energized gas consisting essentially of  $O_2$  in the chamber to at least partially remove etchant residue from the surfaces in the chamber and to remove residual charge accumulated in the substrate; and

(d) after (c), removing the substrate from the chamber.

51. (twice amended) A method of etching a substrate in a chamber and at least partially removing etchant residue from surfaces in the chamber, the method comprising:

(a) supporting the substrate in the chamber, the substrate having a first and a second layer thereon, the second layer comprising a metal silicide layer;

(b) providing a first energized gas in the chamber to etch the first layer;

(c) providing a second energized gas in the chamber to etch the second layer and at least partially remove the etchant residue formed on the surfaces in the chamber in (b); and

(d) providing an energized cleaning gas to at least partially remove residues formed on surfaces in the chamber in (b) and (c).